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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,293	04/14/2009	Ilkka Kojo	OUTT 3501	2363

7812 7590 04/04/2011

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EXAMINER	
ABOAGYE, MICHAEL	

ART UNIT	PAPER NUMBER
1733	

MAIL DATE	DELIVERY MODE
04/04/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,293	KOJO, ILKKA	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-41* is/are pending in the application.

4a) Of the above claim(s) *35-41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *27-41* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Status of claims

1. Claims 1-26 have been cancelled and new claims 27-41 have been introduced.

Election Restrictions

2. Applicant's indication of election of group I (claims 27-34) in the reply filed on 01/24/2011 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). With respect to the new claims 35-41 drawn to a method of operating a suspension smelting furnace, it is noted that Applicant has received an action on the merits for the originally presented invention comprising claims 27-34 (group I); this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, the new claims 35-41 drawn to the method are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03

The requirement is still deemed proper and is therefore made FINAL

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okomoto et al. (US Patent No. 6,001,148) in view of Frundl et al. (US Patent No. 3,666,248).

Regarding claim 27, Okomoto et al. teaches a suspension smelting furnace installation comprising: a suspension smelting furnace defining a vertical reaction shaft for roasting and smelting dried concentrates in suspension (see, figure 1 and abstract), the reaction shaft having a top level, a concentrate burner (12, figure 1), mounted on top of the reaction shaft, the concentrate burner, a bin (reads on the dust silo and the powder coke silo, figure 1) having an inlet for receiving a supply of fine-grained material and also having an outlet below the top level of the reaction shaft, a feed control unit for receiving the fine-grained material from the outlet of the bin and providing the fine-grained material with accurately controlled feed rate (figure 1 shows feed rate data provided at the bin outlet which is an indicator or the presence of a feed rate controller or a control means, see, figures 1and column 4, lines 50-62); and a pneumatic conveyor (reads on the air conveyance system, see, column 4, lines 15-22) positioned to receive the fine-grained material from the feed control unit and adapted to transport the fine-grained material to the concentrate burner with a feed rate that equals the feed rate at which the fine-grained material is provided by the feed control unit (see, figure 1 shows a burner being fed with powdered iron ore concentrate at the same rate as registered at the outlet of the bin; and tables 6 and 9 also show feed rate data).

Okamoto et al. does not particularly specify the type of concentrate burner used.

Frundl et al. teaches as known in the art for furnaces to be provided with burners that are of the sleeve type (see, Frundl et al., column 5, lines 10-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. to use a sleeve type burner, since such burner is known to perform well with suspension furnaces and providing maximum heat input for melting the charged material as disclosed by Frundl et al., (see, Frundl et al., column 5, lines 10-15).

Regarding claim 28, Okomoto et al. in view of Frundl et al. teaches a bin for receiving fine-grained material is a first bin for receiving a dried mixture of metal concentrate and fluxing agent (see Okomoto et al., tables 1 and 4), the feed control unit for receiving the fine-grained material from the outlet of the bin is a first feed rate controller (see, tables 6 and 9 of Okomoto et al., show feed rate data), the installation further comprises a second bin for receiving flue dust and a second feed rate controller for receiving the flue dust from the second bin and providing the flue dust with accurately controlled feed rate (see Okomoto et al., figure 1), and the pneumatic conveyor is positioned to receive both the dried mixture of metal concentrate and fluxing agent from the first feed rate controller and the flue dust from the second feed rate controller (see, Okomoto et al., figure 1 and column 4, lines 17-24 and lines 55-62).

5. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. (US Patent No. 6,001,148) in view of Frundl et al. (US Patent No.

3,666,248) as applied to claim 27 above and further in view of Becerra-Novoa et al. (US Patent No. 5,445,363).

Regarding claims 30 and 31, Okamoto et al. in view of Frundl et al. fails to specify the pneumatic conveyance system as been either a dilute-phase pneumatic conveyor or a dense-phase pneumatic conveyor.

Becerra-Novoa et al. teaches as known in the art to provide smelting furnaces with any one of a dilute-phase pneumatic conveyor and a dense-phase pneumatic conveyor (see, Becerra-Novoa et al., column 5, line 59-column 6, line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. to use a pneumatic conveyance system comprising a dilute-phase pneumatic conveyor or to use a dense-phase pneumatic conveyor as exemplified by Becerra-Novoa et al., in order to push the solid fine-grained matter at high velocity by the gas pressure differential or to order to push the solid fine-grained matter at low velocity by the gas pressure differential respectively.

6. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. (US Patent No. 6,001,148) in view of Frundl et al. (US Patent No. 3,666,248) as applied to claim 27 above and further in view of Becerra-Novoa et al. (US Patent No. 5,445,363) and Davis (US Patent No. 2,757,782).

Okamoto et al. in view of Frundl et al. teaches an air-lift type pneumatic conveyor that is provided with an expansion vessel-adapted to feed the particulate matter into the

burner of the suspension smelting furnace (see, figures 1, 3 and 4 of Okamoto et al.), but fails to mention an air lock feeder and an air-slide conveyor.

Becerra-Novoa et al., teaches an air-lift type pneumatic conveyor that is provided with an expansion vessel-adapted to feed the particulate matter into the burner of the suspension smelting furnace via an air-lock feeder (see, Becerra-Novoa et al., column 14, lines 50-60), and said air-lock feeder allows the feed line pressure to be regulated.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. to use an air- lock feeder as taught by Becerra-Novoa et al., as it would allow feed line pressure to be regulated (see, Becerra-Novoa et al., column 14, lines 50-60).

Okamoto et al. in view of Frundl et al. and Becerra-Novoa et al. fails to specifically mention an air-slide conveyor.

Davis teaches conveyances systems known in the art and commonly used in furnace and smelter installation systems to include: screw conveyors, air slide conveyor and shuttle conveyors.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. and Becerra-Novoa et al. to use a pneumatic conveyance system that is an air-slide conveyor, since such is among the commonly used systems known in the art as taught by Davis and, therefore selection to used such system in the apparatus of Okamoto et al. in view of Frundl et al. and Becerra-Novoa et al. would have meant a mere substitution of one

known conveyance system for another which would have only yielded a predictable result.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. (US Patent No. 6,001,148) in view of Frundl et al. (US Patent No. 3,666,248) as applied to claim 14 above and further in view of Hoper (US Patent No. 4,844,915).

Okamoto et al. in view of Frundl et al. teaches a feed control unit and a pneumatic conveyor that is an air-lift type pneumatic conveyor (see, Okamoto et al., figures 1, 3 and 4).

However, Okamoto et al. in view of Frundl et al. fails to specify said control unit as being a loss-in-weight controller.

Hoper teaches a loss-in-weight controller as one of the known feed control units used in the art (see, Hoper, column 7, lines 1-10) that can be controlled either manually or automatically to provided a constant flow or supply of the feed material to a furnace, a smelter, a reactor or a boiler (see Hoper, column 3, lines 41-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. to use a feed control unit comprising a loss-in-weight controller as taught by Hoper, as it would allow a constant and continuous flow or supply of the feed material to the furnace (see Hoper, column 3, lines 41-55).

8. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. (US Patent No. 6,001,148) in view of Frundl et al. (US Patent No. 3,666,248) as applied to claim 14 above and further in view of Becerra-Novoa et al. (US Patent No. 5,445,363) and Hoper (US Patent No. 4,844,915).

Okamoto et al. in view of Frundl et al. teaches a feed control unit, and pneumatic conveyor that is an air-lift type pneumatic conveyor (see, Okamoto et al., figures 1, 3 and 4), but fails to specify the pneumatic conveyance system as been either a dilute-phase pneumatic conveyor.

Becerra-Novoa et al. teaches as known in the art to provide a smelting furnace with a pneumatic conveyor in the form of a dilute-phase (see, Becerra-Novoa et al., column 5, line 59-column 6, line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. to use a to use a pneumatic conveyance system comprising a dilute-phase pneumatic conveyor as exemplified by Becerra-Novoa et al., in order to push the solid fine-grained matter at high velocity by the gas pressure differential.

Okamoto et al. in view of Frundl et al. and Becerra-Novoa et al. fails to specify said control unit as being a loss-in-weight controller.

Hoper teaches a loss-in-weight controller as one of the known feed control units used in the art (see, Hoper, column 7, lines 1-10) that can be controlled either manually or automatically to provided a constant flow or supply of the feed material to a furnace, a smelter, a reactor or a boiler (see Hoper, column 3, lines 41-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Okamoto et al. in view of Frundl et al. and Becerra-Novoa et al. to use a feed control unit comprising a loss-in-weight controller as taught by Hoper as it would allow a constant and continuous flow or supply of the feed material to the furnace (see Hoper, column 3, lines 41-55).

Response to Arguments

9. Applicant's arguments filed 01/24/2011 have been fully considered but they are not persuasive.

Applicant argues that the examiner reliance on the legend "air 100 Nm3/h" adjacent the outlet of the iron ore bin in FIG. 1 of Okamoto as indicating the presence of a feed control unit for providing feed of fine-grained material with an accurately controlled feed rate. Neither the legend in FIG. 1 nor the description at column 4, lines 50-62 provides any information regarding the rate of supply of iron ore or coke. There is no suggestion in Okamoto et al that supply of iron ore or coke to the air flow is metered in any fashion.

In response, it is noted that figures 1 clearly shows both powdered coke and iron bins provided with controlled valves that are configured for discharging material at a metered rate and such rated are cleared illustrated in tables 6 and 9.

Applicant also argues that the examiner reliance on the schematic illustration in FIG. 1 of Okamoto as disclosing this feature. FIG. 1 of Okamoto et al. can no more be relied upon as disclosing the relative location of the outlet of the iron ore or coke bin

relative to the furnace 10 than it could be as showing that the iron ore bin is about 6 cm high and 1.8 cm wide. The positioning of components shown in FIG. 1 is dictated by convenience of illustration rather than accurate illustration of relative locations and sizes.

In response, it is noted that in the apparatus of Okamoto et al. the particulate material is fed to the reaction shaft by air lifting (see, Okamoto et al. column 4, lines 15-22 and lines 55-62) and such description clearly suggests that the bin outlet for discharging the fine-grained material is below the top level of the reaction shaft; and such is accurately illustrated in figure 1.

Applicant further submits that the fact that Frundl contains a reference to a sleeve portion 54 at column 5, line 11 does not support the contention that the furnace 10 is a sleeve type burner. In a sleeve type burner, the suspension is formed by virtue of the high feed rate created by a pneumatic conveyor and a central jet cone mechanically enhances the formation of the suspension. The prior art does not suggest that the cupola furnace of Frundl et al should be used as a concentrate burner.

In response, it is noted that Frundl et al. describes said sleeve type burners perform very well with suspension furnaces, hence one of ordinary skill in the art would be motivated to use such furnace as a preferred device in the apparatus of Okamoto et al. with a reasonable expectation of successfully optimizing the smelting process.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A./
Examiner, Art Unit 1733
/Scott Kastler/
Primary Examiner, Art Unit 1733